



WESTMINSTER ASTRONOMICAL SOCIETY, INC. (WASI)



Membership News



Volume 1 – Number 2

(formerly the Mason Dixon)

January 2023

Message from our Club President, Cindy Ward

Happy New Year, WASI Members!

When I was a new-ish WASI member, then-President Jim Reynolds threw out a statistic that I found shocking. He said that in Maryland, night skies are overcast approximately (80%?) of the year. As a lifelong Marylander, I thought that number seemed high. I need to let Jim know that I am now convinced. Here's hoping that 2023 brings us some wonderful stargazing opportunities!

As I mentioned at our January meeting, I recently visited two places that are worth the drive:

National Watch & Clock Museum in Columbia, PA. Incredible collection & history. [Exhibits - National Association of Watch & Clock Collectors, Inc. \(nawcc.org\)](https://www.nawcc.org)

Dogstar Books in Lancaster, PA. Floor-to-ceiling used books. Slogan is "Books for the Sirius reader". [About Us \(dogstarbooks.com\)](https://www.dogstarbooks.com)

Any interest in a field trip?
Clear skies,

Cindy

Leadership Updates – Curt Roelle, BOD/Life Member

With a new year comes updates in leadership positions. We give our sincere thanks to Ian Slepian and Slava Muryhin for their many hours of service to WASI and welcome Narayan Nair and Jack Ganssle to officer positions.

A special thanks to Vanessa Thomas who served three years as the Chairman of the Board, now passing the gavel to Tony Falletta.

Board of Directors: <http://www.westminsterastro.org/about/> Chairman: Tony Falletta
Board Members: Curt Roelle; Vanessa J. Thomas; Pankaj "Doc" Desai; Jim Reynolds

Officers: President: Cindy Ward Past President: Chris Bennett
1st Vice-president: Narayan Nair 2nd Vice-president: Jeffrey Silver
Treasurer & ALCOR: Laurie Ansorge Secretary: Jack Ganssle

Committee Leadership:

Astrophotography Committee Chairman: Chris Bennett

Bear Branch Planetarium Director: Pankaj "Doc" Desai

Blaine F. Roelke Memorial Observatory & Observing Committee Director: Jeff Burns

Charlotte's Quest Observatory Director: Chris Bennett

Additional Offices: Librarian & Program Coordinator: Curt Roelle; Outreach Director: Wayne (Skip) Bird; Webmaster: Tom Milley

Ready for some WASI spirit? Cindy Ward is enabling acquisition of new WASI branded items for purchase. And if you visit the store with your new item, the vendor can etch your name on the cup for an additional \$3. Details to come!



Counting Photons – Jack Ganssle, Secretary



One of my photos caught a quasar whose light left that body some 10.7 billion years ago. The catalogs peg the quasar at magnitude 18 – pretty dim! How many photons was my telescope gathering from it each second? Take a guess – my initial speculation was a couple per second and I was way off.

I really don't know the answer so thought it might be fun to play with the math. First, consider this: stars and quasars radiate photons more or less in every direction, fairly spherically. At 93 million miles our sun is a nearby neighbor, but that means there's the surface of a sphere with a radius of 93 million miles that the sun's radiation constantly passes through. High school algebra tells us that area is $4\pi r^2$, or $4 * 3.14 * 93,000,000^2$, or about 10,863,000,000,000,000 square miles. If you were to look at the sun, your eyes, which are only a microscopic fraction of a square mile, would get enough energy to fry your retina. Yet the sun is radiating enough energy to do that to an area of $10.863 * 10^{18}$ (see sidebar 1) square miles.

Wow!

But that's nothing. The quasar is spewing photons out to a sphere's surface (at Earth's distance) of $4\pi * (10.7 * 10^9)^2$ square miles, or over a hundred billion billion square miles. That's a staggering flood of photons.

In 1856 Norman Pogson proposed that for every five magnitudes, stars were 100 times dimmer. A very faint (to the naked eye) star of 6th magnitude is 100 times dimmer than a decently-bright 1st mag

Sidebar 1 – Exponential Notation

In astronomy the distances are incredibly vast. For example, M101, the Pinwheel Galaxy, is 21 million light years away. Since one light year is 6 trillion miles (6,000,000,000,000 miles) that puts M101 $21 * 6$ million trillion miles from us, or 186,000,000,000,000,000 miles. (That assumes I got the number of zeroes right!) We need a better way to write these numbers down.

It's much easier to think in terms of exponential notation, which is just using powers of ten. We use a "base" of 10, and the little number to its upper right (the exponent) tells us how many times we multiply by ten. So 10^2 is $10 * 10$, or 100; 10^3 is $10 * 10 * 10$ or 1000. A trillion is 10^{12} , or a one with 12 zeroes after it. One light year is 6 trillion miles, which is expressed as $6 * 10^{12}$ miles.

The nice thing about exponential notation is it's easy to multiply. You simply multiply the numbers before the base (before the 10), and then add the exponents. M101 is 21 million ($21 * 10^6$) light years ($6 * 10^{12}$ miles) away, which is $21 * 6 * 10^{(6+12)}$, or $186 * 10^{18}$ miles away.

Distances are never exact in astronomy so it's logical to round numbers. Instead of $186 * 10^{18}$ round that to $200 * 10^{18}$. But 200 is $2 * 10^2$, so if you're as lazy as me an even easier way to express this distance is $2 * 10^{(18+2)}$, or $2 * 10^{20}$ miles.

That sure beats writing 2 with 20 zeroes after it! The amazing thing is that M101, at such a vast distance, is easy to see in a small telescope.



M101 posing for a selfie, taken at Bear Branch

orb. Thus, each step in the magnitude scale represents the 5th root of 100, or 2.512. Go from a first to second magnitude star and the latter is 2.512 times dimmer than the former. A third magnitude star is $2.512 * 2.512$, or 6.3 times dimmer than one of 1st.

We can compute the quasar's photon flux using these magnitudes. Our sun has an apparent magnitude of about -27. That's 45 magnitudes brighter than the quasar (at mag 18 it is $27 + 18$ mags dimmer than the sun).

At 45 mags fainter than the sun, the quasar is 2.512^{45} times dimmer (to us on Earth). That's 10^{18} times less light. (How do we go from 2.512^{45} to 10^{18} ? See sidebar 2).

Each square meter of the Earth's surface receives about 1300 watts from the sun, and one watt is around $3 * 10^{18}$ photons per second (it varies some with wavelength). One square meter thus gets $1300 * 3 * 10^{18}$ photons/second, which is $3900 * 10^{18}$, or (rounding a little) $4 * 10^{21}$ photons/second.

That quasar is illuminating a square meter of the Earth with $4 * 10^{21}$ photons/second divided by the difference in brightness between it and the sun of 10^{18} , or $4 * 10^{(21-18)}$ photons/second. That's $4 * 10^3$, or 4000 photons per second per square meter.

My telescope has an 8-inch mirror, which is 20 cm. Its radius is half that: 10 cm or 0.1 meter with an area of $\pi * 0.1^2$, or about 0.03 meter. Since the quasar showers us with 4000 photons/second/square meter, my telescope collects $0.03 * 4000$, or 120 photons per second from it. Given that I've used some approximations it's probably more reasonable to waffle a bit and say "on the order of a hundred" photons per second.

Way more than I would have guessed.

Sidebar 2 – Fun with logarithms

Remember logarithms from high school? No? Well, logs are the opposite of exponential notation. The log of 10^X is simply X.

I used the number 2.512^{45} in the text, which, to me, is hard to understand. Powers of 10 are more intuitive as it's easy to think of a one followed by some number of zeroes. So, we want to solve for X in this equation:

$$10^X = 2.512^{45}.$$

If we take the log of both sides we get:

$$\log(10^X) = \log(2.512^{45})$$

Which is:

$$X = 45 * \log(2.512)$$

Your calculator will show the log of 2.512 is about 0.4. So:

$$X = 45 * 0.4, \text{ giving us } X \text{ being about } 18. \text{ So:}$$

$$10^{18} = 2.512^{45}$$

Observatory News – Jeff Burns, Director

In the works is a purchase of a new/more robust mount for the Blaine F. Roelke Observatory. Here is a summary of the situation and the work that we have done leading up to our recommendation.

- The mount starting exhibiting issues in early spring of this year.
- The mount totally failed when we attempted to re-install the mount & telescope upon completion of the dome remodel
- The observatory team contacted customer service at Celestron and performed the following trouble-shooting steps
 - Reboot and restart of the system
 - Inspecting and cleaning internal components
 - Uploading new drivers for the controller, control board, and encoders

- Replacement of the hand controller
- Nothing worked despite best efforts by the team

After significant effort we came to the conclusion that our best option was to purchase a new mount for the observatory. Observatory team members performed a market assessment to determine the best mount options for our consideration. The research was led by Chris Bennett and included inputs from several other members of the club. The mount option chosen is the Astro Physics AP 1100 – <https://www.astro-physics.com/1100gto>.

A small working group convened yesterday afternoon to review the options and drive towards a recommendation for the board's consideration. Team members on the call were: Frank Roelke, Dawn Harry (BBNC), Curtis Roelle, Chris Bennett, Laurie Ansorge, Jeff Burns, and Steve Conard was consulted.

During this meeting team members reviewed and discussed the specifications for each mount compared to our clubs requirements which include:

- Ease of use so that we may train and qualify folks with varying skill levels
- Rapidity of start up to avoid delays in starting our observing session
- Robustness, durability, longevity, and resilience to stand up to our club's use and the observatory environment
- Ability to handle the anticipated loading to adequately manage the telescopes and accessories with margin for future expansion

The matter was brought to the Board of Directors (Vanessa Thomas, Curt Roelle, Tony Falletta, Pankaj (Doc) Desai, and Jim Reynolds) for budget approval and passed.

In addition, life member/Outreach Director Skip Bird is starting a funding drive to help replace the funding used for the acquisition in the observatory account. If you know of companies or individuals looking to make a tax deductible donation to our 501c3 corporation, please let Skip Bird or Treasurer Laurie Ansorge know.

Current status: Chris Bennet is managing the order through AP which requires the request to wait in a queue until they are ready to receive and fulfill the order.

Observatory Campaign – Skip Bird, Outreach Director/Life Member

Launched in December 2022, and running through March 2023, our observatory campaign is intended to help replenish the depletion of the observatory account from the pending mount replacement/upgrade.

Background: The funds currently in the account were obtained through mostly one-time collections. The annual in/out flows of the club do not cover income to the observatory account. Having an account balance is enabling us to manage needs without having to wait for funding (pending availability by manufacturers).

Our goal is \$13,000 by the end of March. As of this writing (1/15/2023) we have collected \$1,019.73, 7.84% of our goal with more on the way.

Does your company offer corporate donations or matching programs? WASI is a 501c3 nonprofit organization in good standing and donations may be tax deductible (always consult tax expertise).

Member Observations & Spotlight

JUPITER, 20 INCH TEETER DOB, EFL 2032MM, 0017
22-10-20 00-37-25_NEXIMAGE 5, best 1200 of 1500
frames in PIPP and BEST 480 in ASI, RSTAX, WINDOWS
PHOTO



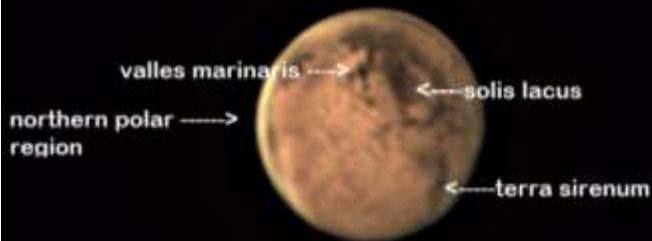
IAN SLEPIAN



Micheal Newman: Comet C/2022 E3

From Ian Slepian:

MARS 12 20 2022. 22_33_39. 11 INCH F/10 SCT
WITH 2X POWERMATE (EFL 5600MM), ZWO 462
MC, SHARPCAP, PIPP, BEST 40 P CNT OF 4K
frames in ASI RSTAX AND WP.
IAN SLEPIAN



More from Ian Slepian:



M42 OCTOBER 21, 2022 11 IN SCT NIKON
D7100 30 SEC ISO 3200, W9 USC_1070
IAN SLEPIAN



M37, OPEN CLUSTER, OCTOBER
21, 2022, 11 INCH SCT, NIKON
D7100, 30 SEC, ISO 3200,
WINDOWS PHOTO

Jackie Donaldson, Curt Roelle, and Gary Hand went to see Apollo 13 lunar module pilot Capt. Fred Haise on Nov. 3 at the Smithsonian Institution's National Air & Space Museum's Udvar-Hazy Center in Chantilly, VA.

Jackie took quite a few photos, including this one showing Curt and Fred.



From Jackie Donaldson: I wanted to say something and shake his hand as many people were just getting autographs and walking away. So I told him about wanting to be an astronaut but I had 2 issues. I suck at math and get carsick.... I got the response I was hoping for 😊 Belly laughs are the best! BTW he will be 89 in the next few days



BBNC Property Usage – Jeff Burns, Point of Contact (POC)

To schedule time at Bear Branch, contact Jeff Burns at least 2 days before the desired time. The Nature Center needs notice at least before noon of the day requested to ensure scheduling of the property. As always, when the observatory is back up and running, only trained members may schedule it and run equipment.

And now the 'fine print' (to keep in good graces with our Bear Branch partners):

- BBNC and WASI must be aware of property usage by authorized personnel for liability and other reasons.
- Club members must be mindful of other usages in progress (e.g. quiet space for meditations and yoga, and observatory use by other trained entities like camps and outdoor school).

Membership Report – Laurie Ansoorge, Treasurer (AWAITING FINAL BOD APPROVAL)

I brought to the general membership meeting and the Board of Directors a proposal for changing the dues structure and timeline that benefits everyone. I noticed that with our annual renewals we lose about 40% of our membership annually in January (with dues due in December). Offering multiple year memberships would provide for less transactions and burden, and offering price breaks could incentivize the change while improving retention. Here are the highlights:

- Everyone who has renewed for 2023, or signs up for membership by 2/28/2023 will have their membership expiration date extended through 6/30/2024 (currently expires 12/31/2023).
- The new membership year runs from July 1 – June 30.
- This aligns our membership year with the Astronomical League year and lines up those dues/subscriptions (gets into 'inside baseball' in details).
- As before, new members joining ½ way through the year or later (was on/after July 1, now on/after January 1) get membership for the remainder of the year and through the next year (e.g., maximum of 18 months depending on date joined).
- NEW; sign up for:
 - 1 year membership remains \$25 for individuals or families
 - 2 year membership for individuals or families @ \$45
 - 4 year membership for individuals or families @ \$80
- Your membership expiration date is reflected on membership cards. There is no price break on the \$5/year youth memberships.

What do I do now?

- If you've renewed, do nothing. You're good until 6/30/2024!
- If you haven't renewed, please renew so we don't lose you!
- Rate structure goes into effect 3/1/2023, after which, any dues payments get added onto your current membership.

2022 Treasury Highlights – Laurie Ansoorge, Treasurer

- For all accounts we began the year with \$42,530.21 and ended the year with \$40,770.27

- The observatory account expenditures were \$4,756.54 including upgrades in the planetarium to complement the new wi-fi link
- In the general account our income exceeded budget by \$662.90 for a total of \$2931.90
- General account budgeted expenses \$2544.05 with actuals of \$2,130.75 for an underspend of \$413.30
- The 2023 budget has been approved by the Board of Directors

Not your Newsletter of Yesteryear

This is a newsletter reinvented for and with our technology today.

Wanted: pictures, articles, and some editorial help for the newsletter – send to Laurie Ansorge.

Here’s a compare and contrast that gives some insight into what this revised newsletter hopes to accomplish as it evolves:

Today	Yesteryear
<ul style="list-style-type: none"> ★ Calendar of events is on Night Sky Network ★ File and message sharing/storage in “groups.io” ★ Casual sharing of pictures and information publically on social media like FaceBook, or within the club with the distribution lists like: https://westminsterastro.groups.io/g/main ★ Clickable lines to refreshed information on the internet ★ I hope that this updated newsletter helps connect the people of WASI by personal stories, pictures and links related to our common love of astronomy 	<ul style="list-style-type: none"> ★ Upcoming events was a staple of newsletters ★ Snail mail, hand offs in person and publishing documents in the newsletter was how documents were shared ★ Casual sharing at meetings or events and phone calls may have missed sharing with those not present ★ Copying, handing out, mailing, missing information was more labor intensive for all involved

Have an idea? Is there something you’d like to do to add to the club? Contact any officer or board member and share. You might have the next great idea!

From the WASI Time Machine (back issues of the Newsletter):

<https://www.westminsterastro.org/mda-3/>

Here’s an excerpt from [July 2011](#), Jim Reynolds was president, and Skip Bird was the Observatory Chair. There were annual picnics! Curt was working on getting the Roelke building plans redone for permitting. Featured was a “25 years ago” section by Curt on Halley’s Comet:

“Comet P/Halley was still hanging around the inner solar system...

“WASI scheduled several public comet watches during the spring. WASI had a slide show and comet watch at Piney Run Park on April 26, the backup date...

“We returned to the Hashawha Environmental Center for a star party on May 4. (A huge one had been previously held there in December.) On May 10, the following weekend, WASI held an Astronomy Day event at the Westminster public library. The April WASI meeting featured member reports on — what else — Halley’s Comet...”


FAQs for You



Facebook - We're active and sharing images on our Facebook page, found at this link:

Join/Renew membership link: <https://www.westminsterastro.org/join-wasi/>

- ★ If you've already entered your contact information (renewing), skip the "database" link: <https://paypal.me/WAstroSIInc>
- ★ Dues are payable via PayPal on the link above, by check or cash (and through your bank's on-line bill payment).
- ★ Membership Dues are \$25/year for individuals or family, and youth under 18 is \$5/year.
 - ✓ On time payment means eligibility for the annual incentive
 - ✓ Keep access to the members-only groups.io pages/information
 - ✓ Receive members-only access/notifications on Night Sky Network
 - ✓ Keep/get discount rates for popular astronomy magazines
 - ✓ Borrow from the WASI scope/literature library

• **Files and club member correspondence & wiki links** are found here:  <https://westminsterastro.groups.io/g/main>. Remember to set your communication preferences.

• **Outreach/event** calendar is found on: <https://nightsky.jpl.nasa.gov/index.cfm>. Set your communication preferences here as well.

• **Changed address, email or phone?** Please update your information and send a message to the webmaster and/or treasurer@westminsterastro.org.

We meet monthly on the 2nd Wednesday of the month:

Back to Basics from 7:15 PM – 7:30PM; General Meeting 7:30PM – 9:30PM

Bear Branch Nature Center Carroll County; 300 John Owings Rd.; Westminster, MD 21158

Website: <https://www.westminsterastro.org/> (Zoom info for hybrid meetings)

Mailing Address: P.O. Box 1162; Westminster, MD 21158; United States; **Google Voice Mail:** 443-732-0020

After all those great astro-photographer's postings, here's a little something from the 1/14/2023 star party, with freezing temps, overcast skies, one sucker hole, wind gusts ~20 mph, a truck shielding the telescope, a pair of heated socks and 23 of the brave public lined up at the little Unistellar eVscope that could...

(humble credit: Laurie Ansorge)

